Development of Mathematical Model to Describe pH effect in Enhanced Biological Phosphorus Removal Process

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Abstract

pH has been known to be an important factor in enhanced biological phosphorus removal (EBPR) process. In the anaerobic phase of EBPR process, phosphate accumulating organisms (PAOs) take up acetate and convert it to PHAs (poly-hydroxy alkanonates), which is accompanied with the release of phosphate to obtain the required energy. Since electrical potential of cell membrane is changed according to the variation of pH, the energy requirement of PAOs for the uptake of acetate is also changed depending on pH. Therefore, the overall performance of EBPR process could be influenced by pH, and result in serious deterioration of EBPR process under low pH level. In this study, an EBPR model that could describe this pH effect was developed. And then, the effect of pH on EBPR process was investigated by using continuation technique, especially focused on the variations of internal components of PAOs.

References

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